

Dr. Gerhard Klimeck

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OBJECTIVE

Provide leadership to the Network for Computational Nanotechnology as a Technical Director and continue nanoelectronic research, high performance computing, and software engineering at Purdue University. Serve as a link between JPL and Purdue in these areas of research.

EDUCATION

- Ph.D., Electrical Engineering**, Purdue University, GPA: 4.00/4.00 1994
Thesis: Electron-Electron and Electron-Phonon Interactions in Quantum Transport.
Advisor: Professor Supriyo Datta
- Dipl. Ing., Electrical Engineering**, Ruhr University Bochum, Germany (equiv. M.S.E.E.) 1990
GPA: 5.97/6.00 (converted from German system), Class Rank 2/167
Thesis: Laser Noise Induced Intensity Fluctuations in an Optical Interferometer.
Advisor: Professor Daniel S. Elliott, Purdue.
Engineering Co-op program with Thyssen Mechanical Engineering, RWE, and Siemens AG.

EMPLOYMENT

- Purdue University**, School of Electrical and Computer Engineering
Professor, Technical Director of the NSF Network for Computational Nanotechnology 12/03-present
- Jet Propulsion Laboratory**, Applied Cluster Computing Technology / High Perf. Computing Group
Principal Member of Technical Staff 9/01-present
Technical Group Supervisor of the Applied Cluster Computing Technology Group 4/02-12/03
Senior Member of Technical Staff 2/98-9/01
- Development of an atomistic nanoelectronic modeling and simulation tool
 - Development of a genetic algorithm based optimization and synthesis tool
 - Parallelization of Mars imaging software
- Texas Instruments Incorporated**, Corporate Research and Development 9/95-2/98
(transitioned to **Raytheon TI Systems**, Applied Research Laboratories 8/97).
Member of Technical Staff - Nanoelectronics Research Group
- Development of the Nanoelectronic Modeling software (NEMO) including theory, algorithms, user-interface, implementation, verification, documentation and delivery.
 - Project Management: responsible for proposal development, project planning, labor scheduling, agency interaction, monthly reports to NRO/NSA, and quarterly reviews.
- University of Texas at Dallas**, School of Engineering 5/97-8/97
Lecturer. Teaching "Advanced Semiconductor Device Theory", graduate level course with about 18 students, primary text book: S. Datta, "Quantum Phenomena"
- University of Texas at Dallas**, School of Engineering 2/94-9/95
Post-doctoral Research Associate - Supervisor: Professor William R. Frensley
- Prototype development of NEMO. Consultant to Texas Instruments Corporate Research and Development. Provided grid generation algorithms for DARPA/ULTRA.
- Purdue University**, School of Engineering 9/90-1/94
Research Assistant - Supervisor: Professor Supriyo Datta
- Ruhr-University Bochum**, School of Engineering 2/88-8/88
Research Assistant - Supervisor: Professor Eckhard Kneller

SELECTED HONORS

- Author of, or major contributor to, successful research proposals worth over \$2.7M.
- Co/Author of over 321 publications: 51 journal, 46 proceedings, 158 conf., 66 seminars/reviews.
- JPL Dr. Edward Stone Award for Outstanding Research Publication 2002.
- US Patent 6,490,193: "Method and System for Generating a Memory Cell".
- Texas Instruments Award for timely delivery of the Phase II NEMO software.
- DARPA Award to Raytheon-TI Systems: Sustained Excellence by a Performer in FY97.
- Scholarships: Purdue Fee Remission Award, National Science Foundation of Germany.
- Member of $\eta\kappa\nu$ EE Honor Society, $\tau\beta\pi$ Engineering Honor Society, IEEE and APS.
- Tae Kwon Do 2nd degree black belt and member of the Caltech Soccer Club.

PUBLICATION SUMMARY

- The following two pages highlight my research activities with references to publications.
- **Publication count:**

	total		total
- Peer reviewed journals:	51	- Technical Reports:	20
- Peer reviewed proceedings:	46	- Invited Seminars:	37
- Invited conference papers:	41	- Technical Program Reviews	29
- Contributed conference papers:	117		
- Citation count in Database of Institute for Scientific Information: 425 (approx. >300 by others).

RESEARCH HIGHLIGHTS (WORK PERFORMED AT JPL)

- **Atomistic Nanoelectronic Modeling in 3-D** – Developed a bottom-up nanoelectronic modeling tool for the analysis of the electronic structure in a nano-scale system based on the representation of each individual atom in the structure. The simulator enables the analysis of electronic structure and optical response in a variety of crystal structures and material systems. The first structures analyzed were quantum dots. General nanoscale electronics problems such as interface roughness, randomized impurities and radiation effects are to be tackled as well. Demonstrated the simulation of a system as large as 32 million atoms. Parallelized the simulator on a Linux-based Beowulf system. Studied effects due to atomic alloy disorder and interface interdiffusion in quantum dots [33, 36, 39, I21-I31]. Optimized material parameters resulted in good experimental agreement for optical transitions in colloidal quantum dots [33,38].
- **Parallelization of Mars Imaging Software** - Converted existing serial Mars imaging software (e.g. mosaic generation from many images, left/right eye correlation for two images) to efficient parallel code. Hardware: COTS Linux-based Pentium III cluster (Beowulf) using MPI. Achieved time reductions from original baseline of 90 minutes to 3 minutes (mosaic software) and 90 minutes to 6 minutes (correlator). This acceleration enables fast feedback (near real-time) to mars rover control [P27, P30].
- **Genetic Algorithm-Based Optimization and Synthesis** - Developed an optimization and synthesis tool based on a massively parallel genetic algorithm (GA) and incorporated various high-level simulation tools into the toolbox.
 - **Material Science:** Performed parameterization of tight banding bandstructure models to achieve the proper representation of basic material properties such as bandgaps and effective masses. NEMO+GA [28, 29, 36, 37].
 - **Electron device synthesis:** Solved the inverse resonant tunneling diode design problem: what is the structure that will generate a particular current-voltage characteristic? NEMO+GA [P18, P20].
 - **Circuit synthesis:** Enabled a GA based circuit configuration on an FPGA to achieve a Gaussian pulse response. SPICE + GA [P22, P23].
 - **Optical filter synthesis:** Optimized a pattern on a frequency selective surface to achieve optimal transmission and reflection. [P22, P23].
- **High Performance Computing Extensions to NEMO 1-D** - Parallelized existing NEMO 1-D software on various simultaneous levels using MPI. Ported parallel code to SGI and Beowulf massively parallel machines. Achieved unprecedented high fidelity resolution of carrier transport through 1-D heterostructures and uncovered unintuitive quantum transport phenomena [30, 31, 32, 34, 40].
- **Tight-Binding Model Theory** - Collaborated with Prof. Tim Boykin on the fundamental understanding of tight binding models and their applications to quantum transport simulations [25-29].

RESEARCH HIGHLIGHTS (WORK PERFORMED PRIOR TO JPL)

- **Comprehensive Quantum Electron Transport** - Principal designer and developer of the NEMO software. NEMO is the world's first comprehensive 1-D quantum electron transport simulator including effects due to charging, multiple bands and scattering. NEMO has shown predictive capabilities useful for devices design and analysis. The world's first high-bias quantum mechanical, simulations of scattering enhanced charging and charge self-consistency of holes and electrons [9-24,P4-P17] for RTDs were generated.
- **High Bias Coulomb Blockade** - Initiated analysis of high bias transport in quantum dots. Key investigator of Coulomb blockade at Purdue University [8,P1].
- **Linear Response of Coupled Quantum Dots** - Proposed experiment on conductance spectroscopy in coupled quantum dots and analyzed experimental feasibility [6,7]. This work is cited over 70 times.
- **Scattering** - Studied the scattering enhanced valley current in RTDs [4,5,9-24,P4-P17].
- **2-D Linear Response** - Analyzed anomalous Quantum Hall Effect in 2-D electron gas system. [3].
- **Laser Noise Experiments** - Implemented high frequency (200MHz) laser amplitude modulation circuitry. Developed laser stability controller (15 kHz) using an external resonance cavity. Measured the propagation of laser noise through optical systems. Calculated and measured higher order, non-linear laser noise fluctuations [1,2].
- **Thin Film Deposition** - Analyzed the experimental feasibility of a novel fast thin film deposition process. Fabricated first clean metallic films (senior project).

PROGRAMMING EXPERIENCE

- **Software Project Management** - NEMO is a simulation tool consisting of about 250,000 lines of code. Tackled issues of software design, documentation, release and maintenance.
- **Hybrid Language Design** - Developed hybrid C, F77 and F90 code which allows the utilization of the flexibility of object oriented C data structures and vectorization capabilities of F77 and F90.
- **Software Documentation** - Invented a software documentation tool that allows for a close connection of the development software and its structural documentation. Pseudo code and code are kept in one file but can be presented in a user friendly, interactive form.
- **Numerical Methods** - Solutions of large, sparse systems of equations, Eigen-value and Eigen-vector analysis of large systems, program vectorization.
- **Software Release** - Released NEMO code at Raytheon with 3,000 pages of documentation, consisting of User's Guide, Theory Guide and Developer's Guide. At Purdue co-authored and released 2 Purdue University simulation packages: SQUALID-2D and QUEST. Developed QUEST User's Manual and Tutorial [T1,T2].
- **Systems** - Linux, HP-9000, SUN, IBM-RISC, SGI, IBM SP2, Ardent, and GOULD, MAC, MS.

TEACHING EXPERIENCE

- Lecturer at University of Texas at Dallas, full semester night time course to ~18 masters and Ph.D. students, "Advanced Semiconductor Device Theory", Text book primarily used: S. Datta, Quantum Phenomena.
- Substitute teaching for Professor Supriyo Datta at Purdue University.
- Mentored Post-Doctoral Researchers and summer students (see professional services section).
- National Research Council Advisor.
- Conducted user training sessions for the NEMO software.
- Instructor of the Purdue Jido Kwan Tae Kwon Do club (3 years).

PERSONAL / ACADEMIC ACHIEVEMENTS

- 10/1987 Best in Prediploma Class in Electrical Engineering at the Ruhr University Bochum.
- 10/1990 Second Best in Diploma Class in Electrical Engineering at the Ruhr University Bochum.
- 01/1994 Defended Ph.D. thesis at Purdue University with GPA of 4.00/4.00.
- 03/1992 1st degree black belt, World Tae Kwon Do Federation, South Korea.
- 05/1993 2nd degree black belt, World Tae Kwon Do Federation, South Korea.

SCHOLARSHIPS

- 04/1987-09/1990 Friedrich Ebert Stiftung, Begabtenförderung, Germany
Full ride scholarship for gifted students providing monthly stipend and book expenses (there is no tuition at public German Universities).
- 04/1987 RWE Industrial Scholarship
Three year scholarship providing stipend for students selected by the Institute of Power Electronics at the University of Bochum.
- 02/1988-09/1990 Studienstiftung des Deutschen Volkes, Begabtenförderung
Most prestigious German scholarship for gifted students from the equivalent of the US National Science Foundation.
- 08/1988-05/1989 Deutscher Akademischer Austauschdienst (DAAD), Integriertes Auslandsstudium
German Academic Exchange Service Scholarship for support of exchange program participation between Bochum and Purdue, providing travel expenses, living-abroad supplement, and US health insurance.
- 08/1988-05/1989 Purdue University Fee Remission Award.
- 08/1989-09/1990 Friedrich Ebert Stiftung, Begabtenförderung
Scholarship expansion for tuition and additional living-abroad supplement.

RESEARCH PROPOSAL AWARDS

- 1999, SBIR Phase I Award, ONR, \$100k, 6 months, "An Advanced CAD Tool for Quantum Device Simulation", PI: Phillip Stout, CRFDR Corporation, Co-I Gerhard Klimeck.
- 12/2001, JPL Directors Research and Discretionary Fund (DRDF), \$100k, 18 months, "Nanoelectronic and Nanomagnetic Devices for Revolutionary Computing and Sensor Applications", PI: Gerhard Klimeck, participating: Fabiano Oyafuso (JPL).
- 03/2002, JPL Internal Research and Development, \$343k, 6 months, "Evolutionary Computing Technologies for Space Systems", PI: Richard Terrile, Co-PI: Gerhard Klimeck, and others.
- 03/2002, NSA/ARDA, \$900k, 3 years, "Nanoelectronic Modeling (NEMO) for High Fidelity Simulation of Solid-State Quantum Computing Gates", PI: Gerhard Klimeck, participating: Fabiano Oyafuso (JPL), Timothy Boykin (U. Alabama Huntsville).
- 07/2002, ONR, \$680k, 3 years, "Atomistic 3-D Nanoelectronic Modeling (NEMO) for Electron Transport in Realistic Nano-Scale Devices", PI: Gerhard Klimeck, participating: Fabiano Oyafuso (JPL), Supriyo Datta (Purdue Univ.).
- 07/2002, SRC, \$468k, years, (JPL collaborator only - no funds exchanged), "Study of Mobility Degradation and Detailed Structure of Si/high-k Interfaces including Dopant Segregation Using AIDA-TEM (Ab-initio Interface Defect detection by Analytic Transmission Electron Microscopy)", PI: Wolfgang Windl (Ohio State U), Co-PIs: Gerd Duscher (North Carolina State U), Maria Merlyne De Souza (De Montfort U).
- 09/2002, NSF Nano Science Center, \$12,500k over 5 years, (JPL is government collaborator – no funds exchanged), "Network for Computational Nanotechnology", PI: Mark Lundstrom.
- 10/2002, JPL Internal Research and Development, \$624k, 12 months, "Evolutionary Computing Technologies for Space Systems", PI: Richard Terrile, Co-PI: Gerhard Klimeck, and others.
- 04/2003, JPL Internal R&TD, \$30k, 3 months, "Simulation of hydrogen sensors with Pd nanowires", PI: Paul von Allmen, Co-I: Seungwon Lee and Gerhard Klimeck.

AWARDS / RECOGNITIONS

- 10/1987 Siemens circle of selected, highly qualified students in Engineering and Sciences. Support for a one-week seminar, science books, selected internships and senior and thesis projects.
- 12/1988 Purdue dean's list.
- 1989 HKN - Electrical engineering honor society.
- 1989 TBP - Engineering honor society.
- 02/1990 Permanent Member of the most prestigious German Science Foundation, Permanentes Mitglied der Studienstiftung des Deutschen Volkes.
- 03/1991 Foundation for German Science, Prize for the especially fast and very successful completion of studies.
Stifterverband für die Deutsche Wissenschaft, Preis für ein in besonders kurzer Zeit sehr erfolgreich abgeschlossenes Studium.
- 1992 Best student presentation in Purdue EE Industry Initiative Workshop.
- 07/1995 Recognition of my US PhD degree within the German official title system by the Department of Science and Research.
Ministerium für Wissenschaft und Forschung des Landes NRW: Zustimmung zur Führung eines ausländischen Grades: Ph.D. (USA) oder Dr. (USA).
- 10/1996 Texas Instruments Award, Citation: Gerhard Klimeck is recognized for outstanding achievement in the development and demonstration of quantum device design tools. His leadership in developing computer code and documentation for NEMO, a world class device modeling program exceeded customer requirements and helped win follow-on contract. Due to this effort, TI has strengthened its competitive position in nanoelectronics and is viewed by our customers as the industry leader in the development of quantum design tools.
- 1997 DARPA, Ultra Dense, Ultra Fast Computing Components, Award to Raytheon-TI Systems: Sustained Excellence by a Performer in Fiscal Year 1997.
- 2002 JPL, Dr. Edward Stone Award for Outstanding Research Publication, Citation: This paper represents a milestone publication for JPL's entry into the field of nanoelectronic device modeling and simulation for future NASA missions. It is also of value to the international semiconductor industry community.
- 2003 NASA Tech Brief Award: NTR no. 30520, "Nanoelectronic Modeling 3-D (NEMO 3-D) Upgrade"
- 2003 NASA Space Act Award: NPO no. 30520, "Nanoelectronic Modeling 3-D (NEMO 3-D) Upgrade"
- 2004 NASA Tech Brief Award: for NTR no 30842: "WIGLAF (A Web Interface Generator and Legacy Application Façade)."

PATENT

- US Patent 6,490,193: "Method and System for Generating a Memory Cell", Paul van der Wagt and Gerhard Klimeck, work performed at Texas Instruments and Raytheon TI Systems.

TECHNICAL GROUP SUPERVISOR (APPLIED CLUSTER COMPUTING TECHNOLOGY GROUP):

- Supervision of 11 computer science, electrical engineering and physics professionals (6 Ph.D., 3 master, 2 bachelor) and one National Research Council post-doc. Responsibilities include:
 - Technical quality of the work produced in the group.
 - Mentoring of the professional careers of the group members (promotions, salary management).
 - Direct interface between two axes of management at JPL: 1) line management (people) and 2) project management (tasks, money). Matching of technical expertise with project requirements.
 - Enforcement of JPL policies.
 - Equipment purchase responsibilities of up to \$150,000.
- Direct technical involvement in a diverse set of tasks:
 - Nanoelectronic modeling for quantum computing gates.
 - Nanoelectronic modeling development of numerically tractable open boundary conditions.
 - Spintronic modeling.
 - Evolvable computing (optimization and synthesis using genetic algorithms).
 - Java and portlet-based graphical user interface development.
 - Cluster computing technologies applied to science applications such as optical as well as synthetic aperture radar (SAR) image processing.
 - Adaptive, unstructured mesh refinement.
 - COTS-based on-board image processing.
 - XML-based non relational database design for project descriptions and evaluations.

PROGRAM COMMITTEE, CONFERENCE PREPARATION, SESSION CHAIR

- Program Committee, 27th international Symposium on Compound Semiconductors (ISCS), IEEE, (2000), Monterey, CA, Oct 2-5, 2000.
- Session Moderator, Quantum Transport, Advanced Research Workshop on Quantum Transport in Semiconductors, Maratea, Italy, June 17-22, 2001.
- Program Committee, Session Chair, Nanoelectronics Session, Nanospace 2002, Galveston, TX, June 24-28, 2002.
- Session Chair, Superlattices and Resonant Tunneling Structures, March Meeting of American Physical Society, March 16-21, Austin, TX (2003).
- Program Committee, 2nd International Workshop on Quantum Dots for Quantum Computing and Classical Size Effect Circuits, University of Notre Dame, August 7-9, 2003.

JOURNAL REVIEWER / REFEREE

- Physical Review B and Physical Review Letters
- physica status solidi b
- Superlattices and Microstructures
- IEEE Transactions on Electron Devices, IEEE Transactions on Nanotechnology
- Journal for Computational Electronics
- VLSI Design

SCIENTIFIC MENTOR / ADVISOR

- Advisor for the National Research Council. Advisor to Dr. Olga Lazarenkova at JPL. 01/03-present.
- Post-Doc mentor / collaborator to Dr. Paul Sotirelis, Texas Instruments, 09/96-01/98.
- Mentor to several summer students in a governmental or industrial laboratory environment:
 - Daniela Francovicchio, Texas Instruments, UT Dallas, 08/95-12/95, NEMO benchmarking.
 - Mukund Swaminathan, Texas Instruments, 06/97-01/98, NEMO software development.
 - William McMahan, Texas Instruments, 05/97-08/97, NEMO database development.
 - Kalen Jordan, JPL, academic part time, 05/01-08/01, Java interface development.
 - Hook Hua, academic part time, 04/02-02/03, Java/XML interface development.
 - Lei Pan, academic part time, 08/03-present, parallel application development.

PUBLICATION SUMMARY

- **Publication count:**

total	total
- Peer reviewed journals: 51	- Technical Reports: 20
- Peer reviewed proceedings: 46	- Invited Seminars: 37
- Invited conference papers: 41	- Technical Program Reviews: 29
- Contributed conference papers: 117	
- Citation count in Database of Institute for Scientific Information: 425 (approx. >300 by others)

SUBMITTED JOURNAL PUBLICATIONS

- [zzz] Seungwon Lee, Paul von Allmen, Fabiano Oyafuso, Gerhard Klimeck, K. Birgitta Whaley, "Effect of electron-nuclear spin interactions on electron-spin qubits localized in self-assembled quantum dots", submitted to Phys. Rev. B. (2004).
- [zzz] Timothy B. Boykin, Gerhard Klimeck, M. A. Eriksson, Mark Friesen, S. N. Coppersmith, Paul von Allmen, Fabiano Oyafuso, and Seungwon Lee, "Analytic solution methods for tight-binding models of quantum-confined heterostructures", submitted to Phys. Rev. B. (2004).
- [zzz] Jeremy Green, Timothy B. Boykin, Corrie D. Farmer, Michel Garcia, Charles N. Ironside, Gerhard Klimeck, Roger Lake, and Colin R. Stanley, "Quantum cascade laser gain medium modeling using a second-nearest-neighbor sp^3s^* tight-binding model", submitted to IEEE J. of Quantum Electronics (2004).
- [y] Paul von Allmen, Gerhard Klimeck, Fabiano Oyafuso, Nick Rizzo, Brad Engel, Herb Goronkin, "Interplay of spin precession and spin diffusion across a semiconductor interface", submitted to Appl. Phys. Lett. (2003).
- [z] Carl L. Garner, Christian Ringhofer, Gerhard Klimeck, and R. Chris Bowen, "Smooth Quantum Hydrodynamic Model vs. NEMO Simulation of a Resonant Tunneling Diode", submitted to Journal of Computational Electronics, 2002.

JOURNAL PUBLICATIONS (WORK PERFORMED AT JPL)

- [51] Timothy B. Boykin and Gerhard Klimeck, "The discretized Schrödinger equation and simple models for semiconductor quantum wells", accepted in Eur. J. of Phys. (2004).
- [50] Olga L. Lazarenkova, Paul von Allmen, Fabiano Oyafuso, Seungwon Lee, and Gerhard Klimeck, "Atomistic model for the simulation of acoustical phonons, strain distribution, and Grüneisen coefficients in zinc-blende semiconductors", accepted for publication in Superlattices and Microstructures (2004).
- [49] Seungwon Lee, Fabiano Oyafuso, Paul von Allmen, and Gerhard Klimeck, "Boundary conditions for the electronic structure of finite-extent, embedded semiconductor nanostructures with empirical tight-binding model", Phys. Rev. B 69, 045316 (2004).
- [48] Timothy B. Boykin, Gerhard Klimeck, and Fabiano Oyafuso, "Valence band effective mass expressions in the $sp^3d^5s^*$ empirical tight-binding model applied to a new Si and Ge parameterization", Phys. Rev. B. 69, 115201, No 11 (2004)
- [47] Timothy B. Boykin, Gerhard Klimeck, Mark Eriksson, Mark Friesen, S. N. Coppersmith, Paul von Allmen, Fabiano Oyafuso, and Seungwon Lee, "Valley splitting in strained silicon quantum wells", accepted for publication in Applied Physics Letters.
- [46] Gerhard Klimeck, "Quantum and semi-classical transport in RTDs in NEMO 1-D", accepted for publication in Journal of Computational Electronics, 2003.
- [45] Christian Rivas, Roger Lake, William R. Frensley, Gerhard Klimeck, Phillip E. Thompson, Karl D. Hobart, Sean L. Rommel, and Paul R. Berger, "Full Band Modeling of the Excess Current in a Delta-Doped MBE Grown Silicon Tunnel Diode", accepted to Journal of Appl. Phys. (2003).

- [44] Fabiano Oyafuso, Gerhard Klimeck, Paul von Allmen, Tim Boykin, and R. Chris Bowen, "Strain Effects in large-scale atomistic quantum dot simulations", accepted for publication in *physica status solidi b* (2003).
- [43] Titus Sandu, Gerhard Klimeck, and Wiley Kirk, "Off-Center Electron Transport and Breakdown of Tsu-Esaki Formula in Resonant Tunneling Diodes due to Incoherent Scattering", *Phys. Rev. B.*, Vol 68, 115320 (2002).
- [42] Fabiano Oyafuso, Gerhard Klimeck, R. Chris Bowen, Timothy B. Boykin, and Paul von Allmen, "Disorder Induced Broadening in Multimillion Atom Alloyed Quantum Dot Systems", *Phys. Stat. Sol. (c)*, vol 0004, pg 1149-1152 (2003).
- [41] Gerhard Klimeck, Fabiano Oyafuso, R. Chris Bowen, Timothy B. Boykin, Thomas A. Cwik, Edith Huang, and Edward Vinyard, "3-D Atomistic Nanoelectronic Modeling on High Performance Clusters: Multimillion Atom Simulations", *Superlattices and Microstructures*, Vol. 31/2, pg 171-179, 2002.
- [40] Gerhard Klimeck, "Parallelization of the Nanoelectronic Modeling Tool (NEMO 1-D) on a Beowulf Cluster", *Journal of Computational Electronics*, Vol. 1, pp 75-79 (2002).
- [39] Fabiano Oyafuso, Gerhard Klimeck, R. Chris Bowen, and Timothy B. Boykin, "Atomistic Electronic Structure Calculations of Unstrained Alloyed Systems Consisting of a Million Atoms", *Journal of Computational electronics*, Vol. 1. Issue 3, pp. 317-321 (2002).
- [38] Seungwon Lee, Jeungnim Kim, Lars Jönsson, John W. Wilkins, Garnett Bryant, and Gerhard Klimeck, "Many-body levels of multiply charged and laser-excited InAs nanocrystals modeled by empirical tight binding", *Phys. Rev. B* 66, 235307 (2002).
- [37] Timothy B. Boykin, Gerhard Klimeck, R. Chris Bowen, and, Fabiano Oyafuso, "Diagonal parameter shifts due to nearest-neighbor displacements in empirical tight-binding theory", *Phys. Rev. B* 66, 125207 (2002).
- [36] Gerhard Klimeck, Fabiano Oyafuso, Timothy B. Boykin R. Chris Bowen, and, Paul von Allmen, "Development of a Nanoelectronic 3-D (NEMO 3-D) Simulator for Multimillion Atom Simulations and Its Application to Alloyed Quantum Dots (INVITED)", *Computer Modeling in Engineering and Science (CMES) Volume 3, No. 5*, pp 601-642 (2002).
- [35] Timothy B. Boykin, R. Chris Bowen, and, Gerhard Klimeck, "Electromagnetic coupling and gauge invariance in the empirical tight-binding method", *Physical Review B*, Vol. 63, pg. 245314 (2001).
- [34] Gerhard Klimeck, R. Chris Bowen, and Timothy B. Boykin, "Strong wavevector dependence of hole transport in heterostructures", *Superlattices and Microstructures*, Vol. 29, No. 3, pg. 187-216 (2001).
- [33] Seungwon Lee, Lars Jönsson, and John W. Wilkins, Garnett Bryant, and Gerhard Klimeck, "Electron-hole correlations in semiconductor quantum dots with tight-binding wave functions", *Phys. Rev. B* Vol. 63, 195318 (2001).
- [32] Gerhard Klimeck, "Indirect bandgap-like current flow in direct bandgap electron resonant tunneling diodes", *Physica Status Solidi (b)* Vol. 226, pg. 9-19 (2001)
- [31] Christian Rivas, Roger Lake, Gerhard Klimeck, William R. Frensley, Massimo V. Fischetti, Phillip E. Thompson, Sean L. Rommel, and Paul R. Berger, "Full Band Simulation of Indirect Phonon-Assisted Tunneling in a Silicon Tunnel Diode with Delta-Doped Contacts", *Applied Physics Letters*, Vol. 78, pg 814, (2001).
- [30] Gerhard Klimeck, R. Chris Bowen, and Timothy B. Boykin, "Off Zone Center (Indirect Bandgap Like) Hole Transport in Heterostructures", *Phys. Rev. B.*, Vol. 63, pg. 195310 (2001).

- [29] Gerhard Klimeck, R. Chris Bowen, Timothy B. Boykin, and Thomas A. Cwik, "sp³s* Tight-Binding Parameters for Transport Simulations in Compound Semiconductors", *Superlattices and Microstructures* Vol. 27, pp. 519-524 (2000).
- [28] Gerhard Klimeck, R. Chris Bowen, Timothy B. Boykin, Carlos Salazar-Lazaro, Thomas A. Cwik, and Adrian Stoica, "Si tight-binding parameters from genetic algorithm fitting", *Superlattices and Microstructures*, Vol. 27, No. 2/3, Mar 2000, pp. 77-88.
- [27] Timothy B. Boykin, R. Chris Bowen, Gerhard Klimeck, and Kevin L. Lear, "Resonant-tunneling diodes with emitter prewells", *Appl. Phys. Lett.*, Vol. 75, 1302 (1999).
- [26] Timothy B. Boykin, Lisa J. Gamble, Gerhard Klimeck, and R. Chris Bowen, "Valence-band warping in tight-binding models", *Phys. Rev. B* Vol. 59, 7301 (1999).
- [25] Timothy B. Boykin, Roger K. Lake, Gerhard Klimeck, and Mukund Swaminathan, "Interface effects in tunneling models with identical real and complex dispersions", *Phys. Rev. B* Vol. 59, 7316 (1999).

JOURNAL PUBLICATIONS (WORK PERFORMED PRIOR TO JPL)

- [24] Gerhard Klimeck, Dan Blanks, Roger Lake, R. Chris Bowen, Chenjing L. Fernando, Manhua Leng, William R. Frensley, Dejan Jovanovic, and Paul Sotirelis, "Writing Research Software in a Large Group for the NEMO Project", *VLSI Design* Vol. 8, pg 79 (1998).
- [23] Seal L. Rommel, Thomas E. Dillon, M. W. Dashiell, H. Feng, J. Kolodzey, Paul R. Berger, Phillip E. Thompson, Karl D. Hobart, Roger Lake, Alan C. Seabaugh, Gerhard Klimeck and Daniel K. Blanks, "Room temperature operation of epitaxially grown Si/Si_{0.5}Ge_{0.5}/Si resonant interband tunneling diodes", *Applied Physics Letters*, Vol. 73, 2191 (1998).
- [22] Gerhard Klimeck, Roger Lake and Daniel K. Blanks, "Numerical Approximations to the Treatment of Interface Roughness Scattering in Resonant Tunneling Diodes", *Semicond. Sci. Technology* Vol. 13, pg. A165 (1998).
- [21] Roger Lake, Gerhard Klimeck and Daniel K. Blanks, "Interface Roughness and Polar Optical Phonon Scattering in InGaAs/AlAs/InAs RTDs", *Semicond. Sci. Technology* Vol. 13, pg. A163 (1998).
- [20] Gerhard Klimeck, Roger K. Lake, R. Chris Bowen, Chenjing L. Fernando and William R. Frensley, "Resolution of Resonances in a General Purpose Quantum Device Simulator", *VLSI Design* Vol. 6, pg. 107 (1998).
- [19] Roger K. Lake, Gerhard Klimeck, R. Chris Bowen, Dejan Jovanovic, Paul Sotirelis and William R. Frensley, "A Generalized Tunneling Formula for Quantum Device Modeling", *VLSI Design*, Vol. 5, pg 9 (1998).
- [18] Gerhard Klimeck, Roger Lake and Daniel K. Blanks, "Role of interface roughness scattering in self-consistent resonant tunneling diode simulation", *Phys. Rev. B*, Vol. 58, 7279 (1998).
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- [C9] Gerhard Klimeck, Guanlong Chen, Roger Lake, and Supriyo Datta "Quantum Transport in Single and Coupled Quantum Dots", Texas Instruments Quantum Device Modeling Workshop, Dallas, Feb. 4-6, 1994.
- [C8] Supriyo Datta, Gerhard Klimeck, and Roger Lake, "Two Approaches to Resonant-Tunneling with Inelastic Scattering: A Comparison", March meeting of the American Physical Society, Seattle, March 22-26, 1993.
- [C7] Roger Lake, Gerhard Klimeck, and Supriyo Datta, "Rate Equations from the Keldysh Formalism Applied to the Phonon Peak in Resonant Tunneling Diodes", March meeting of the American Physical Society, Seattle, March 22-26, 1993.
- [C6] Gerhard Klimeck, Roger Lake, and Supriyo Datta, "Elastic and Inelastic Scattering in the Coulomb Blockade Regime", March meeting of the American Physical Society, Seattle, March 22-26, 1993.
- [C5] Roger Lake, Gerhard Klimeck, and Supriyo Datta, "Rate equations from the Keldysh Formalism Applied to the Phonon Peak in Resonant-Tunneling Diodes" Second International Symposium on "New Phenomena in Mesoscopic Structures", Hawaii, Dec. 7-11, 1992.
- [C4] Gerhard Klimeck, Roger Lake, and Supriyo Datta, "Quantum devices: Where Scattering May Enhance Transport", Purdue Electrical Engineering Industrial Institute Fall Workshop, LED's, HBT's, MBE's, ETC.: What's New in Solid State, October 18-20, 1992.
- [C3] Roger Lake, Gerhard Klimeck, and Supriyo Datta, "A Quantum Device Simulator Based on the Non-Equilibrium Green Function Equations of Keldysh, Kadanoff, and Baym", International Workshop on Computational Electronics, Beckman Institute of the University of Illinois; May 28-29, 1992.
- [C2] Gerhard Klimeck, Ce Chen, Daniel S. Elliott, "Nonlinear Interactions Involving The Real Gaussian Field", Twelfth International Conference on Atomic Physics, University of Michigan, Ann Arbor, July 1990.
- [C1] C. Xie, Gerhard Klimeck, Ce Chen, Daniel S. Elliott, "Nonlinear Interactions Involving The Real Gaussian Field", Optical Society of America Annual Meeting, 1990.

TECHNICAL REPORTS (WORK PERFORMED AT JPL)

- [T20] Gerhard Klimeck, Fabiano Oyafuso, Hook Hua, "XML-based C++ Code Generation for User Interface Integration", Oct. 8, 2002, NTR 30844, JPL New Technology Report.

- [T19] Gerhard Klimeck, E. Robert Tisdale, Fabiano Oyafuso, Hook Hua, "Nanoelectronic Modeling (NEMO 3-D) upgrade to no license restrictions", Oct. 8, 2002, NTR 30843, JPL New Technology Report.
- [T18] Thomas A. Cwik, Akos Czikmantory, Gerhard Klimeck, Fabiano Oyafuso, Hook Hua, Edward S. Vinyard, "WIGLAF (A Web Interface Generator and Legacy Application Façade)", Oct. 8, 2002, NTR 30842, JPL New Technology Report.
- [T17] Gerhard Klimeck, "Structure Based simulator Input using tcl/tk", Oct. 3, 2002, NTR 30835, JPL New Technology Report.
- [T16] Gerhard Klimeck, E. Robert Tisdale, Fabiano Oyafuso, R. Chris Bowen, "Parallel Complex Hermitian Sparse Matrix Eigensolvers", Oct. 3, 2002, NTR 30834, JPL New Technology Report.
- [T15] Gerhard Klimeck, Gary M. Yagi, "Quality Control of Tiepoints Computed from Image Correlation", April 1, 2002, NTR 30632, JPL New Technology Report.
- [T14] Gerhard Klimeck, Robert Deen, Michael McAuley, Eric DeJong, "Parallel Algorithms for Near-Real-time Image Correlation", April 1, 2002, NTR 30631, JPL New Technology Report.
- [T13] Gerhard Klimeck, Robert Deen, Michael McAuley, "Parallel Algorithms for Near-Real-time Mosaic Generation", April 1, 2002, NTR 30630, JPL New Technology Report.
- [T12] Gerhard Klimeck, Fabiano Oyafuso, R. Chris Bowen, Timothy B. Boykin, "Nanoelectronic Modeling 3-D (NEMO 3-D) upgrade", Jan. 6, 2002, NTR 30520, JPL New Technology Report.
- [T11] Gerhard Klimeck, "Tightgen - genetic algorithm-based tight binding parameter generation", Oct. 3, 1999, NTR 20877, JPL New Technology Report.
- [T10] Thomas A. Cwik, Gerhard Klimeck, "Integrated Design and Optimization of Microelectronic Devices", Dec. 16, 1998, NTR 20625, JPL New Technology Report.
- [T9] Gerhard Klimeck, "JPL NEMO, Benchmarks including Compiler-Based Parallelization", Sept. 23, 1998, NTR 20552, JPL New Technology Report.
- [T8] Gerhard Klimeck, "JPL NEMO extension for Hole transport", Aug. 1998, JPL New Technology Report.
- [T7] Gerhard Klimeck, "Nanotechnology", Annual report of the Center for Integrated Space Microsystems (CISM) 1999.
- [T6] Gerhard Klimeck, "NEMO Benchmarks on SUN, HP, SGI, and Intel Pentium II", <http://hpc.jpl.nasa.gov/PEP/gekco/parallel/benchmark.html> (1998)

TECHNICAL REPORTS (WORK PERFORMED PRIOR TO JPL)

- [T5] Gerhard Klimeck, Roger Lake, Daniel K. Blanks, "NEMO 3.0 User's, Theory and Technical Guide", Raytheon Corporation, <http://www.raytheon.com/rtis/nemo/pubs/nemopubs.htm> (1997)
- [T4] Gerhard Klimeck, Roger Lake, Daniel K. Blanks, "NEMO 2.0 User's and Theory Guide", Texas Instruments Incorporated, 1995.
- [T3] Gerhard Klimeck, "Electron-Phonon and Electron-Electron Interactions in Quantum Transport", Technical Report TR-EE 94-7, Purdue University, May 1994.
- [T2] Gerhard Klimeck, Roger Lake, Michael J. McLennan, and Supriyo Datta; "QUEST User's Manual", Technical Report TR-EE 93-17, Purdue University, April 1993.
- [T1] Michael J. McLennan, Gerhard Klimeck and Supriyo Datta, "SQUALID-2D: Version 1.0 and 1.1, A Guide for the User", Technical Report TR-EE 91-15, Purdue University, April 1991.

INVITED SEMINARS (WORK PERFORMED AT JPL)

- [S37] "Development of NEMO 3-D: Boundary conditions for the electronic structure of finite-extent, embedded semiconductor nanostructures", Gerhard Klimeck, Feb. 27, 2004, Ruhr-University University Bochum, Germany, Host: Prof. Ulrich Kunze.
- [S36] "Development of NEMO 3-D: Boundary conditions for the electronic structure of finite-extent, embedded semiconductor nanostructures", Gerhard Klimeck, Feb. 24, 2004, University of Duisburg-Essen, Germany, Host: Dr. Werner Prost.
- [S35] "Development of the Nanoelectronic Modeling Tool (NEMO): Towards Design, Analysis, Synthesis, and Fundamental Limits", Gerhard Klimeck, Feb. 18, 2004, State University of New York, Buffalo, Host: Prof. Vladimir Mitin.
- [S34] "Computational Nanoelectronics Towards: Design, Analysis, Synthesis, and Fundamental Limits", Gerhard Klimeck, Purdue University, July 28, 2003, Host: Prof. Mark Lundstrom.
- [S33] "Computational Nanoelectronics Towards: Design, Analysis, Synthesis, and Fundamental Limits", Gerhard Klimeck, JPL, Division 32 and 38 Seminar, June 18, Host: Dr. Carl Ruoff, Div 32&38 Chief Technologist.
- [S32] "Computational Nanoelectronics Towards: Design, Analysis, Synthesis, and Fundamental Limits", Gerhard Klimeck, JPL, Section 381 Noontime seminar, April 10, 2003, Host Jason Hyon, Section 381 Deputy.
- [S31] "Computational Nanoelectronics Towards: Design, Analysis, Synthesis, and Fundamental Limits", Gerhard Klimeck, Dr. Ed Stone Award Outstanding Research Publication Award Lecture, JPL, Feb. 18, 2003, Host: Dr. Tom Prince, JPL Chief Scientist.
- [S30] "Modeling of Disordered Multimillion Atom Quantum Dot Systems", Gerhard Klimeck, University of Duisburg, Germany, Nov 13, 2002, Hosts Dr. Werner Prost and Prof. Tegude.
- [S29] "Modeling of Disordered Multimillion Atom Quantum Dot Systems", Gerhard Klimeck, Ruhr-University Bochum, Germany, Nov 11, 2002, Host Prof. Ulrich Kunze.
- [S28] "Development of a Nanoelectronic 3-D (NEMO 3-D) Simulator for Multimillion Atom Simulations and Its Application to Alloyed Quantum Dots", Gerhard Klimeck, California State University Northridge, Northridge, CA, March 29, 2002, Host Prof. Nickolas Kiuoussis.
- [S27] "Development of a Nanoelectronic 3-D (NEMO 3-D) Simulator for Multimillion Atom Simulations and Its Application to Alloyed Quantum Dots", Gerhard Klimeck, Purdue University, West Lafayette, IN, March 20, 2002, Host Prof. Supriyo Datta.
- [S26] "Development of a Nanoelectronic 3-D (NEMO 3-D) Simulator for Multimillion Atom Simulations and Its Application to Alloyed Quantum Dots", Gerhard Klimeck, Notre Dame, South Bend, IN, March 15, 2002, Host Prof. Wolfgang Porod.
- [S25] "Development of a Nanoelectronic 3-D (NEMO 3-D) Simulator for Multimillion Atom Simulations and Its Application to Alloyed Quantum Dots ", Gerhard Klimeck, University of Wisconsin, Madison, WI, March 14, 2002, Host Prof. Bob Joynt
- [S24] "Status of the Nanoelectronic Modeling tool (NEMO 1-D and 3-D) and its planned extension to Spintronics", Gerhard Klimeck, NTT Central Research Laboratory, Erato Project, Feb 8, 2002, Hosts Dr. Michael Stopa and Prof. Tarucha.
- [S23] "Nanoelectronic Modeling (NEMO): Moving from commercial grade 1-D simulation to prototype 3-D simulation", Gerhard Klimeck, University of Tokyo, February 8, 2002, Host Prof. Seigo Tarucha.
- [S22] "Status of the Nanoelectronic Modeling tool (NEMO 1-D and 3-D) and its planned extension to Spintronics", Gerhard Klimeck, Tokyo Institute of Technology, Feb 6, 2002, Host Prof. Oda.

- [S21] "Nanoelectronic Modeling (NEMO): Moving from commercial grade 1-D simulation to prototype 3-D simulation", Gerhard Klimeck, Osaka University, January 30, 2002, Host Prof. Hishiro Hamaguchi.
- [S20] Gerhard Klimeck, "Quantum Dot Modeling using NEMO 3-D", JPL, Section 367 Seminar, February 6, 2001, 126-346, 3p.m.
- [S19] Gerhard Klimeck, "Quantum Dot Modeling using NEMO 3-D", University of California Riverside, Department of Electrical and Computer Engineering, Dec 8, 2000.
- [S18] Gerhard Klimeck, Chris Bowen, Tom Cwik, and Timothy B. Boykin, "A Prototype of a 3-D Nanoelectronic Modeling Tool (NEMO-3D)", Notre Dame, South Bend, IN, April 12, 2000.
- [S17] Gerhard Klimeck, Chris Bowen, Tom Cwik, and Timothy B. Boykin, "A Prototype of a 3-D Nanoelectronic Modeling Tool (NEMO-3D)", General Dynamics Information Systems, Minneapolis, MN, March 22, 2000.
- [S16] Gerhard Klimeck, Chris Bowen, and Tom Cwik, "Simulator Development for Nanoelectronic and Electromagnetic Devices", National Reconnaissance Office, Chantilly, VA, March 31, 1999.
- [S15] Gerhard Klimeck, Chris Bowen, Tim Boykin, Fabiano Oyafuso, Tom Cwik, Carlos Salazar-Lazaro, and Adrian Stoica, "The Nanoelectronic Modeling Tool NEMO and its extension to High Performance Computing", MIT Lincoln Laboratory, Lexington, MA. Dec. 2, 1998.
- [S14] Gerhard Klimeck, Chris Bowen, Tim Boykin, Fabiano Oyafuso, Tom Cwik, Carlos Salazar-Lazaro, and Adrian Stoica, "The Nanoelectronic Modeling Tool NEMO and its extension to High Performance Computing", Gerhard Mercator University Duisburg, Nov 25, 1998.
- [S13] Gerhard Klimeck, Chris Bowen, Tim Boykin, Fabiano Oyafuso, Tom Cwik, Carlos Salazar-Lazaro, and Adrian Stoica, "The Nanoelectronic Modeling Tool NEMO and its extension to High Performance Computing", Ruhr University Bochum, Lehrstuhl fuer Werkstoffe der Elektrotechnik, Nov 23, 1998.

INVITED SEMINARS (WORK PERFORMED PRIOR TO JPL)

- [S12] Gerhard Klimeck, "NEMO: A 1-D Heterostructure Design Tool", Center for Integrated Space Microsystems, Jet Propulsion Laboratory, Pasadena, CA, April 24, 1998.
- [S11] Gerhard Klimeck, "NEMO: A General Purpose 1-D Quantum Device Simulator", November 21, 1997, Intel Corporation, Portland, OR.
- [S10] Gerhard Klimeck, "NEMO: A General Purpose 1-D Quantum Device Simulator", October 6, 1997, Jet Propulsion Laboratory, Pasadena, CA.
- [S9] Gerhard Klimeck, "NEMO: Quantitative RTD Simulation", Hitachi Ltd., Cambridge, UK, July 21, 1997.
- [S8] Gerhard Klimeck, Dejan Jovanovic, "NEMO: Quantum Device Modeling (1-D, 2-D and 3-D), Ultra Electronics Program Review, Estes Park, CO, Oct. 6-10, 1996.
- [S7] Gerhard Klimeck, Roger Lake, R. Chris Bowen, Dan Blanks, Manhua Leng, Chenjing Fernando, Dejan Jovanovic, and Paul Sotirelis, "NEMO: A General Purpose Quantum Device Simulator", IMEC, Leuven, Belgium, May 31, 1996.
- [S6] Gerhard Klimeck, Roger Lake, R. Chris Bowen, Dan Blanks, Manhua Leng, Chenjing Fernando, Dejan Jovanovic, and Paul Sotirelis, "NEMO: A General Purpose Quantum Device Simulator", Ruhr-Universität Bochum, Germany, May 30, 1996.
- [S5] Gerhard Klimeck, Roger Lake, R. Chris Bowen, Dan Blanks, Manhua Leng, Chenjing Fernando, Dejan Jovanovic, and Paul Sotirelis, "NEMO: A General Purpose Quantum Device Simulator", Universität Duisburg, Germany, May 28, 1996.

- [S4] Gerhard Klimeck, Roger Lake, R. Chris Bowen, Dan Blanks, Manhua Leng, Chenjing Fernando, Dejan Jovanovic, and Paul Sotirelis, "NEMO: A General Purpose Quantum Device Simulator", Texas Instruments Research Colloquium, Dallas, TX, May 23, 1996.
- [S3] Gerhard Klimeck, Roger Lake, Garnett Bryant, Guanlong Chen, Supriyo Datta, Chris Bowen, William Frensley, "Elektronen-Elektronen und Elektronen-Phononen Wechselwirkungen in der Nanotechnologie", Ruhr-Universität Bochum, Germany, Dec. 20, 1994.
- [S2] Gerhard Klimeck, Roger Lake, Garnett Bryant, Guanlong Chen, Supriyo Datta, Chris Bowen, William R. Frensley, "Elektronen-Elektronen und Elektronen-Phononen Wechselwirkungen in der Nanotechnologie", Universität Duisburg, Germany, Dec. 15, 1994.
- [S1] Gerhard Klimeck, Roger Lake, and Supriyo Datta, "Erhöhter Stromfluss durch Streuprozesse oder Überraschende Ergebnisse im Bereich der Quantenbauelemente", Ruhr-Universität Bochum, Germany, Jan. 8, 1993.

PROGRAM REVIEWS (WORK PERFORMED AT JPL)

- [R29] Gerhard Klimeck, Timothy B. Boykin, Mark Eriksson, Mark Friesen, Susan Coppersmith, Fabiano Oyafuso, Paul von Allmen, Seungwon Lee, and K. Birgitta Whaley, "Nanoelectronic Modeling (NEMO) for High Fidelity Simulation of Solid-State Quantum Computing Gates", NSA / ARDA / ARO Quantum Computing Technology Workshop, Nashville, TN, August 18-22, 2003.
- [R28] Gerhard Klimeck, Fabiano Oyafuso, Bob Tisdale, Hook Hua, R. Chris Bowen, "Development of a Parallel Eigensystem Solver for Beowulf Clusters", Oct 31 2002, JPL ESTO-CT program review.
- [R27] Gerhard Klimeck, Joey Czikmantory, Hook Hua, "WIGLAF – A Web Interface Generator and Legacy Application Facade", Oct 31 2002, JPL ESTO-CT program review.
- [R26] Gerhard Klimeck, Timothy B. Boykin, Fabiano Oyafuso, and Paul von Allmen, "Nanoelectronic Modeling (NEMO) for High Fidelity Simulation of Solid-State Quantum Computing Gates", NSA / ARDA / ARO Quantum Computing Technology Workshop, Nashville, TN, August 19-23, 2002.
- [R25] Nikzad Toomarian, R. Chris Bowen, Gerhard Klimeck, "Quantum Dot Modeling – Development of a Bottom-Up Nanoelectronic Modeling Tool", May 9, 2001, JPL CISM (Center for Integrated Space Microelectronics) zero-base review of RCT (Revolutionary Computing Technologies) program.
- [R24] R. Chris Bowen, Gerhard Klimeck, "Quantum Dot Modeling – Development of a Bottom-Up Nanoelectronic Modeling Tool", September 2000, JPL CISM (Center for Integrated Space Microelectronics) review of RCT (Revolutionary Computing Technologies) program.
- [R23] R. Chris Bowen, Gerhard Klimeck, "Quantum Dot Modeling – Development of a Bottom-Up Nanoelectronic Modeling Tool", August 1 2000, JPL CISM (Center for Integrated Space Microelectronics) review of RCT (Revolutionary Computing Technologies) program.
- [R22] R. Chris Bowen, Gerhard Klimeck, "3-D Quantum Device Simulator Development", March 18, 1999, JPL CISM (Center for Integrated Space Microelectronics) review of RCT (Revolutionary Computing Technologies) program.

PRESENTATIONS AT PROGRAM REVIEWS (WORK PERFORMED AT TEXAS INSTRUMENTS)

[R1-R21] The National Reconnaissance Office, sponsor of the NEMO program, required a quarterly program review. Prof. David Ferry (ASU), Prof. George Haddad (U. of Michigan), and Dr. Harold Grubin (SRA) were hired as scientific reviewers by the program sponsor. In addition, program managers from other agencies such as ONR, DARPA, and NSA were typically present. The reviews were generally held in the Central Research Lab of Texas Instruments or at the DFW Hilton. Individual presentations listed below lasted typically 25-45 minutes.

- [R21] Gerhard Klimeck, "NanoElectronic MOdeling–Software Development Approach", Dec. 1997.

- [R20] Gerhard Klimeck, “Program Status, Activities Overview”, May 19, 1997.
- [R19] Gerhard Klimeck, “Software Development – Theory”, May 19, 1997.
- [R18] Gerhard Klimeck, “Software Demo”, May 19, 1997.
- [R17] Dan Blanks, Gerhard Klimeck, “Software / Interface Development”, Nov. 1996.
- [R16] Gerhard Klimeck, “Test Matrix Results”, Nov. 1996.
- [R15] NEMO Phase I Review in Washington DC, “NEMO Software Summary”, May 1996.
- [R14] NEMO Phase I Review in Washington DC, “NEMO Software Tutorial” (3 hours), May 1996.
- [R13] Gerhard Klimeck, “NEMO: Software Development”, Feb. 7, 1996.
- [R12] Gerhard Klimeck, “NEMO: GUI Development”, Feb. 7, 1996.
- [R11] R. Chris Bowen, Gerhard Klimeck, “Multiband Simulations”, Feb. 7, 1996.
- [R10] Gerhard Klimeck, “GUI and Theory Interaction - A Dynamic Design”
- [R9] Gerhard Klimeck, “NEGF Code Development”, October 11, 1995.
- [R8] R. Chris Bowen, Gerhard Klimeck, “Multiband Simulation Results”, October 11, 1995.
- [R7] Gerhard Klimeck, William R. Frensley, Chenjing L. Fernando, R. Chris Bowen, “Non-Equilibrium Green Function Approach – Software Development”, June 27, 1995.
- [R6] R. Chris Bowen, Gerhard Klimeck, William R. Frensley, “Multiband Simulations”, June 27, 1995.
- [R5] Chenjing L. Fernando, Gerhard Klimeck, William R. Frensley, “Polar Optical Phonon Scattering Simulations”, June 27, 1995.
- [R4] Gerhard Klimeck, William R. Frensley, Chenjing L. Fernando, R. Chris Bowen, “Non-Equilibrium Green Function Approach – Software Development”, Feb. 23, 1995.
- [R3] Gerhard Klimeck, William R. Frensley, Chenjing L. Fernando, R. Chris Bowen, “Non-Equilibrium Green Function Approach – Software Development”, Feb. 23, 1995.
- [R2] Gerhard Klimeck, William R. Frensley, Chenjing L. Fernando, R. Chris Bowen, “Non-Equilibrium Green Function Approach – Software Development”, fall 1994.
- [R1] William R. Frensley, Gerhard Klimeck, Chenjing L. Fernando, R. Chris Bowen, “Non-Equilibrium Green Function Approach – Software Development”, summer 1994.